

theirs may point to its not lying on quite the same line of descent.

Though I would not attach too much importance to it, I would again call attention to the fact already mentioned, that in Carnivora, and still more so in Insectivora, rudiments of a penetration of the enamel by dentinal tubes occur with more frequency than in other mammals. This may possibly indicate some remote connection with the Marsupials, but the point which I wish to emphasise is that, as regards this character, the Creodonts carry us absolutely no further than do the recent Carnivora.

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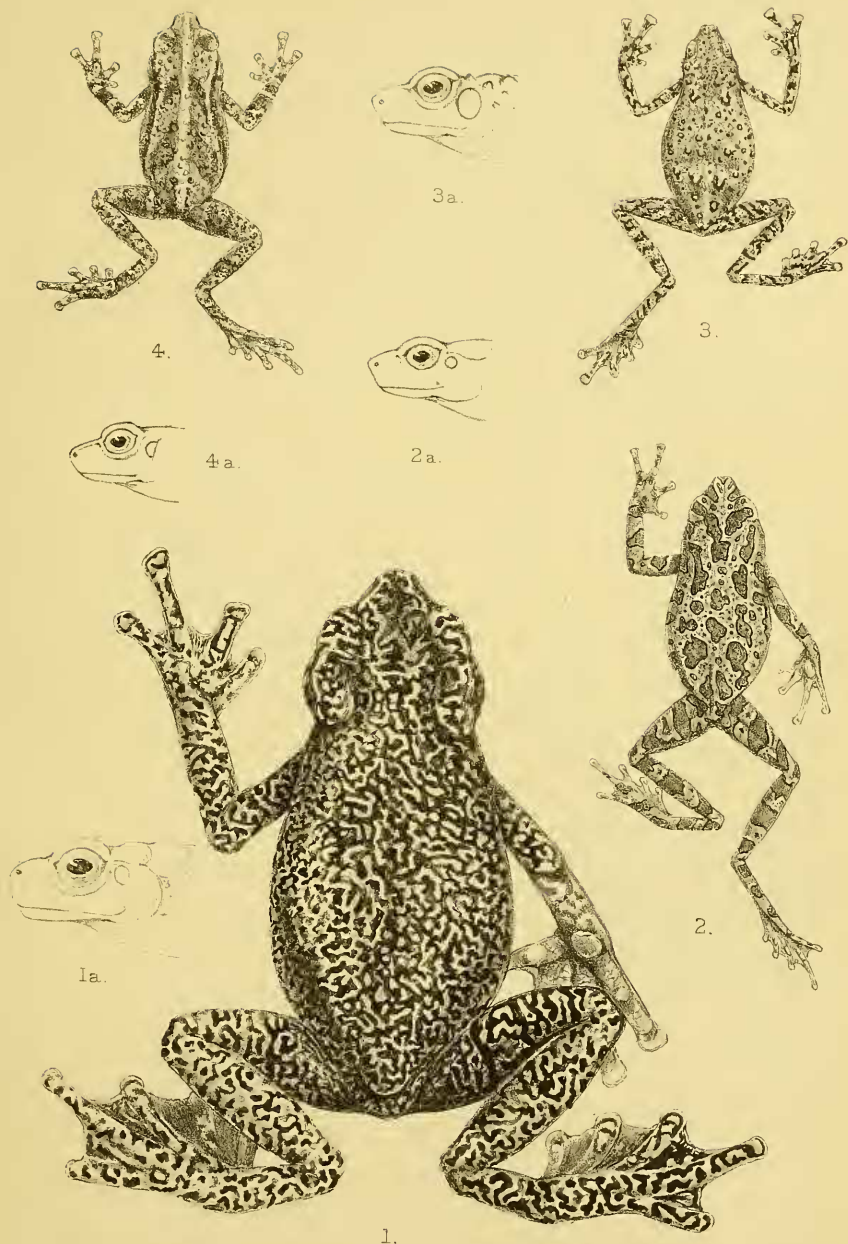
4. Synopsis of the Toads of the Genus *Nectophryne* B. & P., with special Remarks on some known Species and Description of a new Species from German East Africa. By Dr. JEAN ROUX, Curator in the Basle Museum of Natural History.

[Received December 11, 1905.]

(Plate II. \*)

On visiting, last spring, the beautiful collections of the Museums of Paris and London, I had occasion to examine, especially in the British Museum, most of the typical specimens of the known species of the genus *Nectophryne*. Whilst verifying the diagnoses, I was able to make some observations modifying or completing

\* For explanation of the Plate, see p. 65.



J. Green del. et lith

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1. NECTOPHRYNE HOSII. 2. N. EVERETTI. 3. N. MACROTIS.  
4. N. TORNIERI.



somewhat the descriptions of the authors. I was able to identify as one species two that had previously been considered different.

I add to these observations the description of a new species from German East Africa, the type of which is preserved in the Basle Museum, and conclude this paper with a key for the determination of all the known species of the genus.

I am happy on this occasion to express my best thanks to Dr. Mocquard, of Paris, who was so kind as to allow me to examine the types of the species described by him. I am also much obliged to Prof. Boettger, of Frankfort a/M., and to Prof. Tornier, of Berlin. The former has been kind enough to send to me the type of his *N. exigua* which is preserved in the Senckenberg Museum; to the latter I am indebted for the loan of the types of two species in the Berlin Museum. I am particularly indebted to Mr. G. A. Boulenger, who has obligingly placed at my disposal the valuable collection in the British Museum (Natural History), and has been so kind as to verify the work done in his laboratory.

### 1. NECTOPHRYNE AFRA B. & P.

Buchh. & Peters, Mon. Berl. Akad. 1875, p. 202, pl. ii. f. 5.

Boulenger, Cat. of Batrach. Sal. p. 279.

Examined: The type specimen (Berlin Museum): Cameroon.

6 specimens (Brit. Mus.): Efulen, S. Cameroon,  
and Rio Benito.

This species occupies quite a special place as regards its webbed fingers, the subarticular tubercles of which imitate small lamellæ.

### 2. NECTOPHRYNE MISERA Mocq.

Mocquard, Le Naturaliste, 1890, no. 82, p. 182; Nouv. Arch. Muséum Paris, sér. 3, tom. ii. p. 161, pl. xi. f. 7.

Examined in Paris Museum: Type specimen, N. Borneo.

In Brit. Mus.: 10 specimens from Paka-Paka, 10,000 feet, Kina-Balu, N. Borneo.

This species has also strongly webbed fingers, but no sub-articular tubercles. Sometimes the tibio-tarsal articulation does not quite reach the tympanum.

### 3. NECTOPHRYNE HOSII Blgr. (Plate II. fig. 1.)

Boulenger, Proc. Zool. Soc. Lond. 1892, p. 508, pl. xxx. fig. 2.

Examined in Brit. Mus.:—

Type specimen (♂). Mt. Dulit, N. Borneo.

2 specimens (♂ ♀). Kuala Lumpur, Selangor.

2 ♂. Lawas, Brunei.

1 ♂. Head-waters of Sarawak R.

1 ♂, 2 ♀. Sarawak.

1 ♀. Tandjong, S.E. Borneo.

1 ♀. Akar River, Sarawak.

This is the largest species of the genus. The diagnosis given by Boulenger in 1891 was drawn up from a male specimen from Mt. Dulit, Borneo. Since then the collection of the British Museum has been increased by several specimens, especially females, which I have had the privilege to study. As is often the case with *Bufo*, in this species the female individuals are notably larger than the males. The distinctive characters indicated by Boulenger are generally very well marked in the female. The head is broader in comparison with the length. The canthus rostralis is well marked. The loreal region is nearly vertical and shows a slight depression in the upper part. The interorbital space, twice as broad as the upper eyelid, is very distinctly concave, as well as the part of the head situated near the parotoids. The tympanum is very distinct; it is suboval, vertically elongated, and half as long as the eye. The parotoids are well marked, pyriform, and begin immediately behind the eyes.

As to the limbs, we have noticed individual variations in the length, especially in the hind limbs. The fore limb is relatively long: the fingers, webbed only at the base, are bordered by the membrane, and the distal part is subtriangularly enlarged; this peculiarity is more appreciable in the fingers than in the toes. The hind limbs of most of the individuals observed are longer than in the type specimen. The hind limb being carried forward along the body, the tibio-tarsal articulation reaches sometimes the tympanum, sometimes the eye. The toes are generally short, entirely webbed, except the three distal phalanges of the fourth toe, which are free. The subarticular tubercles are very well developed, as well as the two metatarsal tubercles. The outer tubercle is twice as large as the inner. I have noticed the presence of a very distinct tarsal fold.

The coloration of the individuals is worthy of detailed description owing to the marked differences between males and females.

The type specimen, a male, figured by Boulenger, is uniformly brown with some indistinct spots on the limbs; the throat is black. Two other male specimens show the same coloration, but two male specimens from Lawas, Brunei, are somewhat different. The body shows, besides the dark brown, some light brown markings, which form indistinct coarse vermiculations. The limbs are yellowish brown, and present also lighter and darker parts more or less distributed in transverse bands.

The females labelled "Sarawak," one of which is figured on Pl. II. fig. 1, are distinctly bicolor (yellow and black). The ground is black with small vermiculations or round yellow spots (in the latter case especially on the sides of the body). The head, the back, and the limbs show also these vermiculations. The spots are a little broader on the anterior part and on the sides of the head. The lower part of the body and of the limbs is generally dirty grey or uniform yellowish. The border of the lower lip often shows yellow spots. The inferior part of the feet is brown. The females have generally smaller and less numerous



dorsal tubercles than the males. The females from Tandjong (S.E. Borneo) and from Akar River (Sarawak) show the typical coloration above described.

A female specimen from Mt. Kuala Lumpur (Selangor) shows an interesting variation. The general colour is a dark grey, approaching brown. The upper part of the head, of the back, and of the tibia shows no yellow spots, but the sides of the body and of the limbs, as well as the upper part of the thighs, have round or oval spots pretty distant from one another. These spots are of a fine yellow colour, with brown border. Similar but longer spots may be found on the throat and on the anterior part of the chest.

A female from Akar River (Sarawak) shows irregular and indistinctly distributed spots. The yellow colour is prevalent on the back; the sides are marbled yellow and black; the belly is of a dirty yellowish colour.

The following are the dimensions of two individuals from Sarawak found pairing, the female in the act of spawning:—

	♂.	♀.
Length from snout to vent ...	5.65 cm.	9.8 cm.
"    of hind limb .....	7.65 "	13.7 "
"    " fore limb .....	4.3 "	6.9 "

The eggs of *Nectophryne hosii* are oval, 1 millimetre in length; they are laid in chains as in *Bufo*.

#### 4. NECTOPHRYNE PARVIPALMATA Wern.

Werner, Verhandl. zool.-bot. Gesells. Wien, vol. xlviii. 1898, p. 201, pl. ii. ff. 7 & 7 a.

Examined: the type specimen in the Berlin Museum.  
Habitat: Cameroon?

#### 5. NECTOPHRYNE EVERETTI Blgr. (Plate II. fig. 2.)

Boulenger, Ann. Mag. Nat. Hist. (6) xvii. 1896, p. 450.

Examined in the Brit. Mus.:—

The type specimen (♀): Mt. Kina Balu, N. Borneo.

1 ♂ specimen: Mt. Penrissen, Borneo.

In this second individual the tympanum is quite visible, oval. The hind limb being carried forward along the body, the tibio-tarsal articulation reaches between the tympanum and the eye.

#### 6. NECTOPHRYNE TUBERCULOSA (Gthr.).

Günther (*Pedostibes tuberculosus*), Proc. Zool. Soc. Lond. 1875, p. 576, pl. lxiv. fig. C.

Boulenger, Cat. Batr. Sal. p. 280.

Examined in the Brit. Mus.:—

2 ♂ type specimens: Malabar.

The hind limb being carried forward along the body, the tibio-tarsal articulation reaches the tympanum. The upper part of the limbs is also covered with tubercles.

7. *NECTOPHRYNE GUENTHERI* Blgr.

Boulenger, Cat. Batr. Sal. p. 280, pl. xviii. fig. 3.

Boettger (*Nectophryne exigua*), Abhandl. Senck. Gesells. 1901, vol. xxv. p. 394.

Examined in Brit. Mus.:—

The type specimen from Matang, Borneo.

2 young specimens } from Singapore.

2 adult            „

2 adult            „           from Sirhassen (Natuna Isl.).

Also the type specimen of *Nect. exigua* in the Senckenberg Museum: Baram Riv., N. Borneo.

In this species, as in others, I have also noticed individual variations in the length of the limbs. The hind limb being carried forward along the body, the tibio-tarsal articulation reaches sometimes the eye, sometimes between the latter and the end of the snout. In the typical specimen it does not only reach the eye but notably behind it.

Establishing a comparison between the type of *Nectophryne exigua* Boettger and young individuals of *Nectophryne guentheri*, I have been convinced that these two species are identical.

The differences are indicated by Boettger as follows:

“Habitus etwas weniger schlank; Trommelfell kleiner als bei *N. guentheri* Blgr.”

On examining several specimens of *N. guentheri* I have noticed differences not only in the respective length of the body and of the limbs, but also in the respective dimensions of the tympanum and of the eye according to age. The young specimens have proportionally a smaller tympanum than the adults. Besides individual variations have been observed. Some measurements follow:—

	Type spec.	Spec. from Sirhassen.	
Eye .....	3	1·9	2 mm.
Tympanum .....	2	1	1·1 „

## Specimens from Singapore.

Adult.	Adult.	Juv.	Juveniss.
2	1·75	1·9	$\frac{3}{4}$ mm.
1	1·5	1·3	$\frac{1}{3}$ „

A young specimen of *N. guentheri* in particular, which is just as large as the type of *N. exigua*, shows in the general form of the body as well as in the colour a striking likeness to the latter.

Similar black spots are distributed on the belly, and the coloration, yellow and black, on both sides of the head is identical. The limbs show also the same extent of web.

As, on the other hand, it is impossible not to recognise the existing relations between the young specimens of *N. guentheri* with adults of this species, I believe that *N. exigua* may be considered a young specimen of *N. guentheri*. Very appreciable

variations having been noticed between several specimens of the latter, the distinction drawn by Boettger between his species and that of Boulenger cannot be accepted.

8. *NECTOPHRYNE MACROTIS* Blgr. (Plate II. fig. 3.)

Boulenger, Ann. Mag. Nat. Hist. (6) xvi. 1895, p. 171.

Examined in the Brit. Mus. :—

The type specimen (♀) from the Akar River, Borneo.

9. *NECTOPHRYNE SIGNATA* Blgr.

Boulenger, Proc. Zool. Soc. Lond. 1894, p. 645, pl. xl. fig. 1.

Examined in the Brit. Mus. :—

The type specimen from Rabong Mt., Kapuas Distr., Dutch Borneo.

10. *NECTOPHRYNE MACULATA* Mocq.

Mocquard, Le Naturaliste, 1890, no. 82, p. 182; Nouv. Arch. Muséum Paris, 3<sup>e</sup> sér. t. ii. p. 162, pl. xi. fig. 8.

Examined in the Paris Museum :—

3 type specimens from Kina Balu, N. Borneo.

11. *NECTOPHRYNE TORNIERI*, sp. n. (Plate II. fig. 4.)

Habit slender. Head moderate, as long as broad. Snout short, scarcely prominent, obliquely truncate, quite as long as the eye; canthus rostralis strong. Loreal region vertical, slightly concave in the upper part. Interorbital space broader than the upper eyelid. Tympanum exposed, vertically oval, about one-third the diameter of the eye. The distance between the anterior border of the tympanum and the posterior corner of the eye equal to half the distance between the anterior corner of the latter and the nostril. Fore limb slender, equal in length to the distance between vent and tympanum. Fingers moderate, much depressed, webbed at the base, dilated and truncate at the end, first a little shorter than second. The hind limb being carried forward along the body, the tibio-tarsal articulation reaches the posterior border of the eye. Toes half-webbed, but the three distal phalanges of the fourth toe free. The tips of the toes less strongly dilated than those of the fingers. Subarticular tubercles well marked. Two well-developed metatarsal tubercles, the inner the larger. Skin of the upper part of body and limbs covered with numerous small round warts, irregularly distributed; the largest situated behind the tympanum and on the middle of the back; beneath feebly granulate. The granulations are visible on the posterior part of the belly and on the under part of the thighs, and disappear on the throat.

Brown above, with darker markings, especially two pairs on the back: one between the fore limbs, the other on the sacral region. A large lateral dark band from the eye, surrounding the tympanum, which is lighter in colour, and extending on each side



of the body. A dark streak from the end of the snout passing below the canthus rostralis, through the eye, and above the tympanum to the commissure of the mouth. Loreal region brown; a light spot below the eye between yellowish-brown parts of the upper lip. Limbs brownish in colour, with darker markings arranged in indistinct large cross bars. Sides of the body below the dark lateral band lighter than the back, more or less speckled with dark brown. Sometimes a yellowish-brown vertebral stripe extending along the middle of the back, from snout to vent. Beneath entirely white or with a few small dark spots on the throat and belly.

*Hab.* Ukami, German East Africa. 2 specimens.

*Dimensions.*—From snout to vent, 27 mm.; hind limb, 38; fore limb, 20; length of head, 9; breadth of head, 9.5.

Named after my colleague, Dr. Tornier of Berlin, who has added much to our knowledge of the herpetological fauna of German East Africa.

The figured specimen of this new species is preserved in the herpetological collection of the Basle Museum, the other has been presented to the British Museum.

If we now consider the geographical distribution of the genus, we notice that most of the species described are from Southern Asia. Borneo is particularly rich. Not less than six species have been found on this island, and one of them has been found also in the Natuna Archipelago (Sirihassen) and Singapore. New discoveries will most likely further extend the geographical distribution of the other species. But we cannot omit to state the fact that up to this date no *Nectophryne* has been discovered, so far as we know, in the other great islands of the Sunda Archipelago.

The genus *Nectophryne* has representatives also in West Africa. The faunal similarity of that district with the south-east of Asia has often been noticed (see Wallace). West Africa possesses two species, and the new species described above shows that the genus is also represented in the eastern part of the African continent.

I conclude with a synoptic table for the determination of the known species of *Nectophryne*, not taking into consideration doubtful species, as e. g. *Nectophryne sundana* (Ptrs.) (Boulenger, Cat. Batr. Sal. p. 281). I have not been able to examine the only existing specimen of this species, which is preserved in the Berlin Museum and comes from Borneo.

#### *Key for the determination of the Species.*

- I. Fingers strongly webbed, very slightly dilated at the end, the inner quite rudimentary.
  - a. Subarticular tubercles present, similar to small lamellæ ... *N. afra.*
  - b. Subarticular tubercles absent ..... *N. misera.*
- II. Fingers partially webbed, more or less dilated at the end, the inner well developed.
  - A. Tibio-tarsal articulation not reaching the end of the snout.
    - a. Toes only half-webbed ..... *N. tornieri.*

- b. Toes more than half-webbed.
1. A tarsal fold ..... *N. hosii*.
  2. No tarsal fold.
    - α. Tympanum hidden ..... *N. parvipalmata*.
    - β. Tympanum visible, its diameter less than that of the eye; two metatarsal tubercles.
      - \* Fingers very slightly webbed at the base, the first equal to  $\frac{2}{3}$  of the second ..... *N. everetti*.
      - \*\* Fingers very distinctly webbed at the base, the first equal to about  $\frac{1}{2}$  of the second ..... *N. tuberculosa*.
      - \*\*\* Fingers  $\frac{1}{3}$  webbed, the web extending as a margin to their tips; the first equal to  $\frac{1}{2}$  of the second ..... *N. guentheri*.
    - γ. Tympanum visible, equal to the diameter of the eye; only one metatarsal tubercle ..... *N. macrotis*.
- B. Tibio-tarsal articulation reaching at least the end of the snout.
- a. Tympanum visible, equal to  $\frac{2}{3}$  the diameter of the eye... *N. signata*.
  - b. Tympanum hidden; tibio-tarsal articulation reaching beyond the end of the snout..... *N. maculata*.

## EXPLANATION OF PLATE II.

- Fig. 1. *Nectophryne hosii* Blgr., p. 59, female.  $\frac{2}{3}$  nat. size. 1 a. Side view of head.
2. *Nectophryne everetti* Blgr., p. 61, type. Nat. size. 2 a. Side view of head,  $\times 1\frac{1}{2}$ .
3. *Nectophryne macrotis* Blgr., p. 63, type. Nat. size. 3 a. Side view of head,  $\times 2$ .
4. *Nectophryne tornieri* Roux, p. 63, type. Nat. size. 4 a. Side view of head,  $\times 1\frac{1}{2}$ .

5. On some Bones of the Lynx from Cales Dale, Derbyshire.  
By W. STORRS FOX, M.A., F.Z.S.

[Received October 25, 1905.]

(Text-figure 26.)

Remains of the Lynx have so rarely been found in the British Isles, that the recent discovery of some in a Derbyshire cave will, I hope, be considered to be worth recording. The history of the two former finds may be briefly stated. About the year 1866, the hinder portion of a skull and the right ramus of the lower jaw of this species were discovered in Pleasley Vale, on the borders of Derbyshire and Nottinghamshire, and are now in the Nottingham University Museum. Some fourteen years later a humerus and a metatarsal of the same species were found in Teesdale by the late Mr. James Backhouse, and are still in his son's museum at York.

Thus, until the Cales Dale cave was worked, only four bones of Lynx had been found in the British Islands. I have been unable to obtain any information about the excavation in Cales Dale previous to 1897, but my own find there consists of 36 bones and teeth of Lynx, about half of this number being metapodials and phalanges.

The cave lies on the west side of Cales Dale, a small dale branching from the south side of Lathkil Dale, at a point about